STATE OF VERMONT
PUBLIC SERVICE BOARD

Petition of Beaver Wood Energy Pownal, LLC for a Certificate of Public Good, pursuant to 30 V.S.A. § 248, to install and operate a Biomass Energy Facility and an integrated wood pellet manufacturing facility located north of the old Green Mountain Racetrack in Pownal, Vermont, to be known as the "Pownal Biomass Project"	)))))))	Docket No. ____

PRE-FILED TESTIMONY OF ERIC KINGSLEY

ON BEHALF OF BEAVER WOOD ENERGY POWNAL, LLC

October 25, 2010

The purpose of the pre-filed testimony of Mr. Kingsley is to demonstrate that the Project will comply with certain provisions of 30 V.S.A. § 248 (b)(5), namely those pertaining to environmental impacts and specifically to the ability of the local woodshed to supply the Project with biomass in a sustainable fashion.

TABLE OF CONTENTS

EXHIBITS

STATE OF VERMONT
PUBLIC SERVICE BOARD

Petition of Beaver Wood Energy Pownal, LLC for a Certificate of Public Good, pursuant to 30 V.S.A. § 248, to install and operate a Biomass Energy Facility and an integrated wood pellet manufacturing facility located north of the old Green Mountain Racetrack in Pownal, Vermont, to be known as the "Project"	)))))))	Docket No. ____

PRE-FILED TESTIMONY OF
ERIC KINGSLEY

ON BEHALF OF
BEAVER WOOD ENERGY POWNAL, LLC

1. Introduction

Q1. Please state your name, business address and employment.

A1. My name is Eric Kingsley, and I am the Vice-President of Innovative Natural Resource Solutions LLC. My full resumé is provided as Exhibit Petitioners EK-1.

Q2. Please describe your professional experience and educational background.

A2. Since joining Innovative Natural Resource Solutions LLC (INRS) in 2001, I have led the firm's efforts on biomass energy and biomass project development. I have worked on the development, evaluation, acquisition or sale of over fifty biomass energy projects – electric, wood pellet, liquid fuel and thermal. My clients include developers, utilities, and investors. I have worked across the United States and Atlantic Canada; in New England, I have been involved in the development or evaluation of over two dozen biomass energy projects, including PSNH Schiller Station, the only new biomass electric unit constructed in the region in over two decades. I have also conducted work related to biomass energy and forest industry issues for a range of non-governmental organizations and state agencies.

Prior to joining INRS I served as executive director of the New Hampshire Timberland Owners Association (NHTOA) from 1995 to 2000. In that capacity I served as an association head and policy representative for the State's forest industry – including landowners, loggers, foresters, and wood using industries. Public policy related to biomass electric generation was an area of policy focus during my tenure at NHTOA.

I have a Master of Science from the Department of Resource Economics & Development at the University of New Hampshire, and a Bachelor of Arts degree from Ithaca College in New York.

Q3. What is the purpose of your testimony?

A3. The purpose of my testimony is to demonstrate that the Pownal Biomass Project (the "Project") satisfies the requirements of 30 V.S.A. §§ 248(b)(5) by explaining that there is an adequate supply of biomass to supply the Project.

Q4. Have you testified previously before the Board?

A4. I have not.

2. Summary of Findings

Q5. Based upon your evaluation and analyses, does the Project comply with Section 248?

A5. Yes. Beaver Wood Energy proposes construction of an integrated biomass electric and wood pellet manufacturing facility in Pownal, Vermont. This project is expected to utilize roughly 350,000 green tons of wood fuel per year for the generation of electricity and an additional 220,000 green tons of roundwood for wood pellet production. It is well located to secure this volume of biomass fuel and pellet feedstock with modest competition with existing markets.

This region of Vermont is heavily forested, with a strong agricultural base as well. Within a fifty mile radius of the proposed facility there are roughly 3.2 million acres of timberland; 79% of which is in private ownership.

Timber growth on private lands within 50 miles of Pownal, Vermont exceeds annual harvest levels by over 1.8 million green tons annually; nearly 2.4 million green tons when tops and branches are included. There is more than enough wood to sustainably supply a facility at this location.

Using USDA Forest Service Forest Inventory & Analysis tools, I estimate that the annual growth of non-sawlog roundwood wood on private lands within 50 miles of

Pownal exceeds harvest levels by over 800,000 green tons per year. This is nearly four times the volume necessary to support the wood pellet facility.

For biomass fuel, I estimate that over 250,000 green tons of forest residue (tops, branches, etc.) are generated annually from harvests on private land within a 50-mile radius of Pownal. Of this, roughly (125,000 green tons) can be economically captured and used as fuel; the remainder is generally left in the woods for economic and / or environmental reasons. An additional 33,000 green tons of residue can be captured through the incremental harvesting associated with the pellet mill, and 26,000 green tons of bark and other residue will be generated during the wood pellet feedstock preparation process. These direct residue sources account for 185,000 green tons of fuel annually; the remaining fuel will be secured from a variety of sources, including right-of-way maintenance and clearing activities, and some low-quality stems that do meet the specifications for higher-value products (including pellet feedstock) harvested during an integrated timber harvesting operation.

From a wood supply perspective, Pownal is well situated in an area with significant forest resources and a diverse forest ownership base. There is an existing base of loggers to supply the Project; this base can be strengthened with the development of the multiple markets for low-grade wood the Project will provide. Markets for low-grade wood are a cornerstone of good forest management; they provide foresters and landowners with options on how to best manage the land. Benefits of low-grade markets, as will be created the this Project, include the development of some habitat types, improved forest productivity, and the potential for improved long-term forest economics

that helps shield forestland from development pressure. Absent a low-grade market, many landowners resort to high-grading, which *Good Forestry in the Granite State* has defined as "an exploitive logging practice that removes only the best, most accessible and marketable trees in a stand."

For a more detailed explanation of the fuel supply available to the Project, please see the attached Innovative Natural Resource Solutions, LLC Report, Petitioner's Exhibit-EK-2.

3. Conclusion

Q6. Does this conclude your testimony?

A6. Yes.

STATE OF VERMONT

PUBLIC SERVICE BOARD

Petition of Beaver Wood Energy Pownal, LLC for a Certificate of Public Good, pursuant to 30 V.S.A. § 248, to install and operate a Biomass Energy Facility and an integrated wood pellet manufacturing facility located north of the old Green Mountain Racetrack in Pownal, Vermont, to be known as the "Pownal Biomass Project"	)))))))	Docket No. ____

PREFILED TESTIMONY OF
ERIC KINGSLEY

Exhibit BWEP –EK – 1

Resumé

Eric W. Kingsley

Vice President, Innovative Natural Resource Solutions LLC

kingsley@inrsllc.com

Vice-President, Innovative Natural Resource Solutions LLC, 2000 - Present

Thirteen years of professional experience consulting, leadership and research for renewable energy projects, forest industry issues and economics of natural resource-based industries. Practice focused on biomass energy projects.

Project Responsibilities (Partial)

Renewable Energy Facility Development: Work with merchant, utility and municipal developers of renewable energy facilities on economic, regulatory and fuel supply aspects of projects. Issues include siting and permitting, interconnection issues, identification of funding opportunities, and off-grid or behind-the-meter electricity production. Ongoing.

Northern Wood Power Project: Responsible for analysis of wood supply, market research for renewable energy certificates, logging infrastructure, and economic impact of facility for 50 MW biomass power plant in Portsmouth, NH. Client: Public Service of New Hampshire, 2003 – 2005

Biomass Resource Analysis: Regularly perform biomass availability analysis for private clients interested in developing, purchasing, selling or re-starting biomass energy facilities. Clients include but are not limited to Conduit NH Energy LLC, New Energy Capital, Cleaves & Company, Covanta Energy, Dominion, Marubeni Sustainable Energy, D.G. Energy, Russell Biomass, Tamarack Energy, Mascoma, Clean Power Development, NRG Energy, GenPower Services, Anheuser Busch, Honeywell International, Safe Handling, Boralex, Panda Development Group and Wausau Paper. Ongoing.

Renewable Energy Market Analysis: Perform market analysis, including identification and quantification of risks, for developers of new renewable energy generation facilities. Issues include sale of electricity, renewable energy certificates and associated environmental attributes. Ongoing.

National Biomass Database: Led firm effort to develop a national, by county database showing potential biomass fuel availability by type, including forest residues, sawmill residue, net forest growth, urban wood and other sources. Database released in 2007, updates are an ongoing process.

Biomass Strategy Development: INRS has developed or led efforts to develop biomass strategies that focus on client objectives and regional or organizational priorities. Clients include National Association of State Foresters (2008), Massachusetts Division of Energy Resources (2008, unreleased), and The Energy Foundation (in development).

Atlantica Bio-Energy: Member of team assembled by Pricewaterhouse Coopers to evaluate options for next-generation biomass and bio-product development in the New Brunswick, Nova Scotia and Maine. 2008.

New Hampshire Bio-Oil Opportunity Analysis: Conducted full feasibility analysis of bio-oil (pyrolysis oil) manufacturing facility in New Hampshire, including technology review, availability of low-grade wood, feedstock availability and pricing, markets for product, issues for selling energy from facility, and commercialization plan. Client: New Hampshire Office of Energy & Planning, 2004.

Identifying and implementing Alternatives to Sustain the Wood-Fired Electricity Generating Industry in New Hampshire: Served as lead researcher on three phase study analyzing a wide variety of potential markets for low-grade wood, including a comprehensive review of economics of wood-fired power for utility-scale boilers. Client: New Hampshire Department of Resources & Economic Development, 2000 – 2002.

Maine Future Forest Economy: Led comprehensive sector-by-sector analysis of Maine's wood using industries, including analysis of biomass facilities in Maine and opportunities to generate own power or sell renewable power into the grid using forest product manufacturing by-product. Clients: Maine Department of Conservation and Maine Technology Institute, 2004 – 2005

Governor's Council on the Sustainability of the Forest Products Industry: Coordinate research and writing for high-level public-private partnership to address issues in Maine's pulp and paper manufacturing sector. Clients: Maine Department of Economic & Community Development and Maine Technology Institute, 2004 – 2005.

Executive Director, New Hampshire Timberland Owners Association, 1995 –2000

- Responsible for day-to-day operation of 1,500 member 501.c.6 forestry trade association, representing the full spectrum of New Hampshire's commercial forestry community, including wood-using industries
- Represent organization in all legislative and administrative matters, including a successful full-time presence in the state legislature
- Represent organization as counsel pro se on all matters related to wood-fired utilities and utility restructuring before the state's Public Utility Commission
- Testified before U.S. House of Representatives Subcommittee on Forests & Forest Health regarding the future of the Forest Service in September 2000, and the Committee on Agriculture regarding Forest Health Legislation, June 1997

Education

Master of Science, Resource Administration and Management, May 1995
University of New Hampshire, Durham, New Hampshire

Bachelor of Arts, Major in Philosophy, May 1990
Ithaca College, Ithaca, New York

Selected Publications

Establishing Long-Term Supply Agreements for Wood Energy Facilities. Prepared for the Empire State Forest Products Association. June 2008.

Biomass Availability Analysis – Five Counties of Western Massachusetts. Prepared for the Massachusetts Division of Energy Resources and the Massachusetts Department of Conservation and Recreation. January 2008.

Forest Harvesting Systems for Biomass Production. Prepared for the Massachusetts Technology Collaborative. June 2007.

Climate Change and New Hampshire's Forest Industry: A Discussion of Potential Changes. Prepared for Clean Air- Cool Planet and the Society for the Protection of New Hampshire Forests. March 2007.

Maine Future Forest Economy Project. Prepared for the Department of Conservation – Maine Forest Service and the Maine Technology Institute. March 2005.

Identifying and Implementing Alternatives to Sustain the Wood-Fired Electricity Generating Industry in New Hampshire. Prepared for the New Hampshire Department of Resources and Economic Development. January 2002.

Selected Articles and Presentations

Biomass Energy. Presented to the Eastern CANUSA Forest Science Conference, Orono, Maine. October 17, 2008.

Opportunities, Challenges and Considerations for Wood Fuel at Biomass Electric Power Plants. Presented at EUEC Environment & Energy Conference, Phoenix, AZ. January 29, 2008

"The Myth of Free Wood". *Northern Woodlands Magazine.* March 2008.

"A Forest Full of Energy." *Northern Woodlands Magazine.* Spring 2006.

"A Look at the Present and Future of Biomass." *Northern Logger.* November 2005.

Opportunities for Biomass Power in New England. Presented to the Maine Paper Foundation, Orono, Maine. April 6, 2006.

Biomass Energy & Wood-Based Bio-Fuels: What is the New Supply Model? Presented to the SUNY – ESF Conference on "Forest Bio-refinery - Establishing a path forward to cellulosic ethanol and other bio-products", Syracuse, NY.

STATE OF VERMONT

PUBLIC SERVICE BOARD

Petition of Beaver Wood Energy Pownal, LLC for a Certificate of Public Good, pursuant to 30 V.S.A. § 248, to install and operate a Biomass Energy Facility and an integrated wood pellet manufacturing facility located north of the old Green Mountain Racetrack in Pownal, Vermont, to be known as the "Pownal Biomass Project"	)))))))	Docket No. ____

PREFILED TESTIMONY OF
ERIC KINGSLEY

Exhibit BWEP –EK – 2

Innovative Natural Resource Solutions LLC, Report

Biomass Fuel Supply
Pownal, Vermont

Prepared for:

Beaver Wood Energy, LLC

August 2010



Prepared By:

Innovative Natural Resource Solutions LLC

107 Elm Street, Suite 100-G
Portland, ME 04101
207-772-5440

37 Old Pound Road
Antrim, NH 03440
603-588-3272

www.inrsllc.com

Introduction

This document serves as an independent assessment of the availability of a sustainable supply of fuel for a proposed 29.5 MW biomass electric facility and a fully integrated pellet mill. Information contained in this document was developed by Innovative Natural Resource Solutions LLC.

Innovative Natural Resource Solutions LLC (INRS) was hired by to compile this report by Beaver Wood Energy, LLC. INRS has experience with the region's forest products industry and loggers, and has a strong working knowledge of existing and potential markets for biomass in New England.

Innovative Natural Resource Solutions LLC

Founded in 1994, Innovative Natural Resource Solutions LLC (INRS) is a full-service consulting firm specializing in the forest industry, natural resource conservation, and renewable energy.

INRS has worked with a number of parties on the development of new biomass energy facilities around the country. The firm is currently working with developers of biomass or biofuel projects in Maine, New Hampshire, New York, New Jersey, Vermont, Massachusetts, Indiana, Virginia, Georgia and California.

A complete description of INRS activities in biomass energy development, including a partial client listing, can be found at www.inrsllc.com

Table of Contents

Table of Figures & Tables

Executive Summary

Beaver Wood Energy Pownal, LLC ("Beaver Wood") proposes to construct a 29.5 MW wood-fired biomass electricity facility (the "Project") and fully integrated pellet manufacturing facility located in Pownal, Vermont. The project expects to consume roughly 350,000 green tons of wood per year of biomass fuel and another 220,000 green tons of roundwood for pellet manufacturing. This assumes an average moisture content of 45% (varies by season and species) and an average BTU value of 4,625 per pound (9.25 million per ton); these are typical for biomass in this region.

This region of Vermont is heavily forested, with a strong agricultural base as well. Within a fifty mile radius of the proposed facility there are roughly 3.2 million acres of timberland; 79% of which is in private ownership.

Timber growth on private lands within 50 miles of Pownal, Vermont exceeds annual harvest levels by over 1.8 million green tons annually; nearly 2.4 million green tons when tops and branches are included. Excluding sawlogs from the growth-harvest data leaves annual growth exceeding annual harvest levels by 834,000 green tons annually from private lands. Additionally, roughly 126,000 green tons of forest residues are generated annually and potentially available in the region. These sources combine to provide more than enough wood to sustainably supply a facility at this location.

Market Structure for Forest-Derived Wood

Whole–tree chips for use as biomass fuel are the by-product of timber harvesting for sawlogs and lower-grade roundwood (used for pulpwood or pellets). The economics and availability of biomass fuel rests upon the harvesting of higher-value products, with the tops, branches, off-spec wood and economically undesirable species potentially available as biomass fuel.

On timber harvesting operations, the landowners and loggers are generally looking to harvest sawlogs (for lumber) and low-grade roundwood (for pellet and paper mills where this is a geographically accessible market), both generally higher value products than biomass. However, much wood does not meet the rigid specifications for these higher value markets (for example, a length of tree may be crooked, have rot, or have a split in it). For this wood, as well as all tops and branches, loggers have two choices: they can return the wood to the forest and allow it to decay, or they can chip it. Most loggers practice a combination of these approaches.

Loggers and landowners make their money from growing, harvesting and selling veneer, sawlogs and (to a much lesser extent) low-grade roundwood. The health of these markets, particularly sawlogs, is what allows people the economic opportunity to conduct timber harvesting operations.

In general, when a single tree is harvested, a number of products can be derived[i].

- The bottom length (generally eight to sixteen feet) is often straight with relatively few defects such as knots or branches. This section is generally a veneer log, sent to a market that slices or peels the log for plywood, or more commonly a sawlog, and is sent to a sawmill for lumber production.
- The next lengths (again, often eight to sixteen feet) may become a variety of products. If it is straight and has few defects, it is a veneer log or sawlog and will be sent to a sawmill. If it is smaller than the size sawmills require, or has a large number of defects (rot, knots, split, etc.), it will be sent to a pellet mill or to a pulp mill for paper manufacturing. If it is not straight (and thus cannot be cleanly debarked) it will be chipped for use in biomass production or mulch, or left in the woods.
- The tops and branches can be chipped for biomass energy markets, chipped for mulch markets, or left in the woods.

Figure 1 shows the sections of a single tree and the products derived[ii]; figures 2 through 5 show parts of a New England logging operation that will produce whole-tree chips for a biomass power plant.

Figure 1. Schematic of Products Derived from a Single Tree

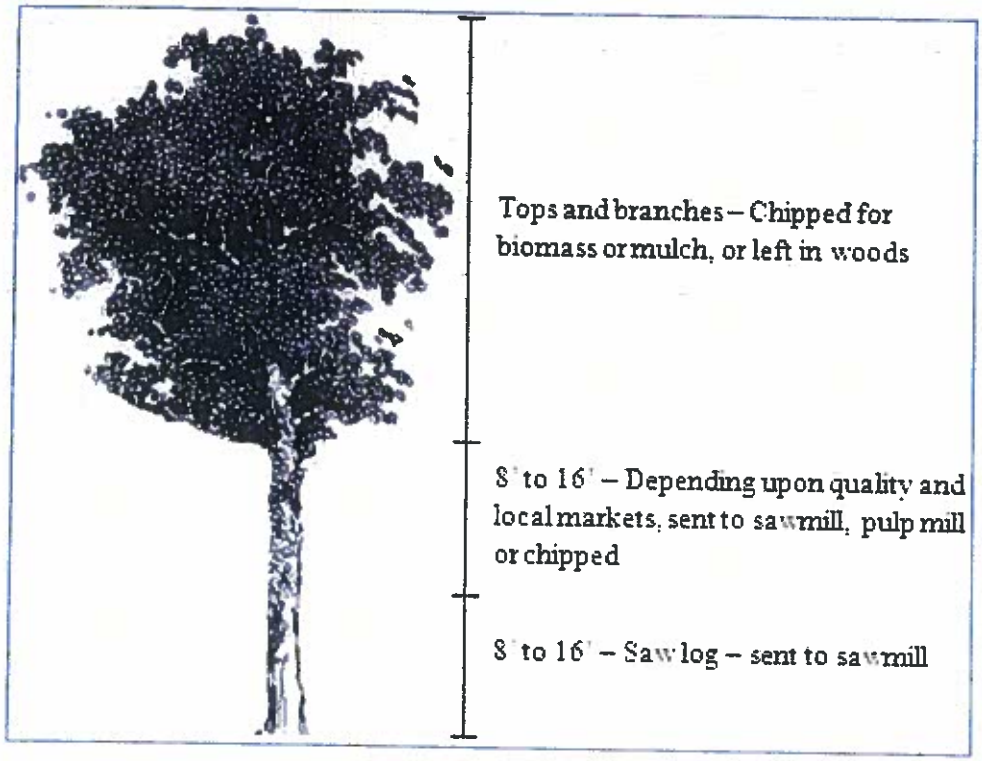


Figure 2. Log landing with slasher (left), chipper (right), and wood sorted by product.

Figure 3. Wood sorted for chipping.

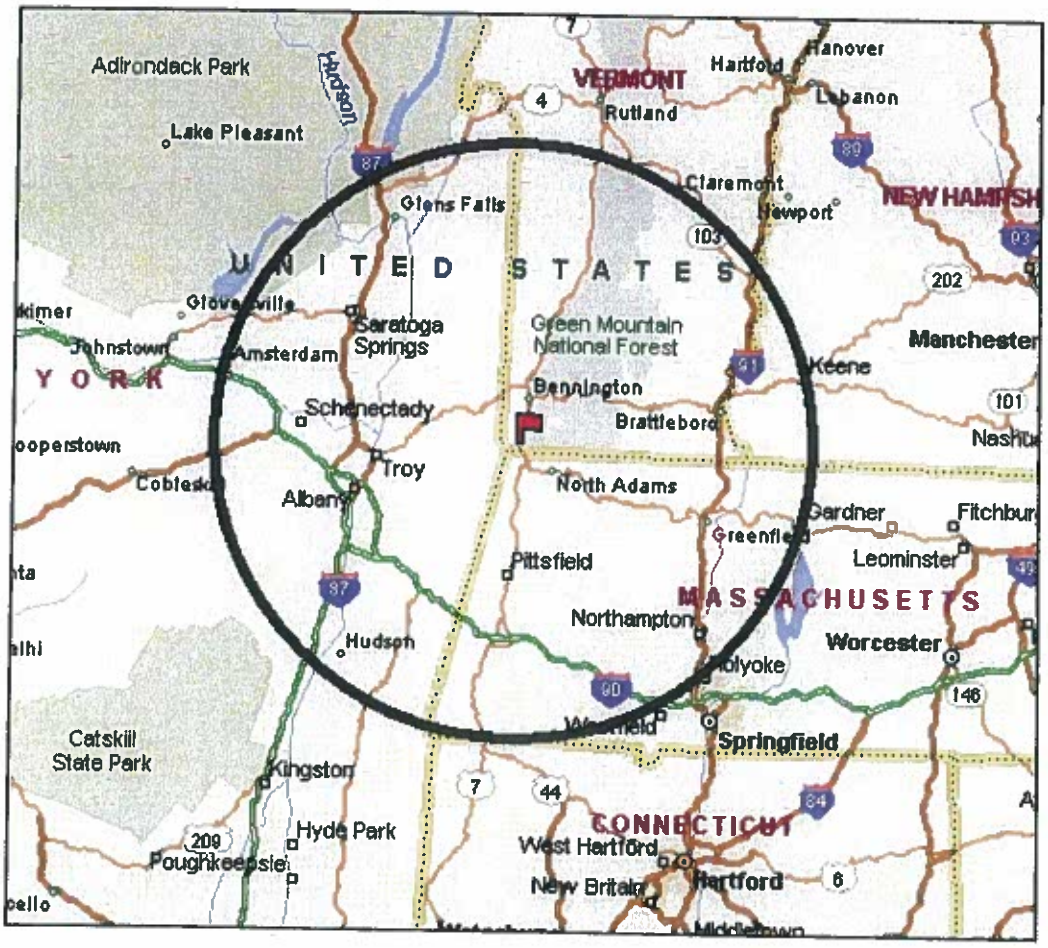
Figure 4. Close-up of chipper on log landing.

Figure 5. Trailer for whole-tree chips, with opening for chipper to blow chips into.

Biomass and Roundwood Availability – Pownal, Vermont

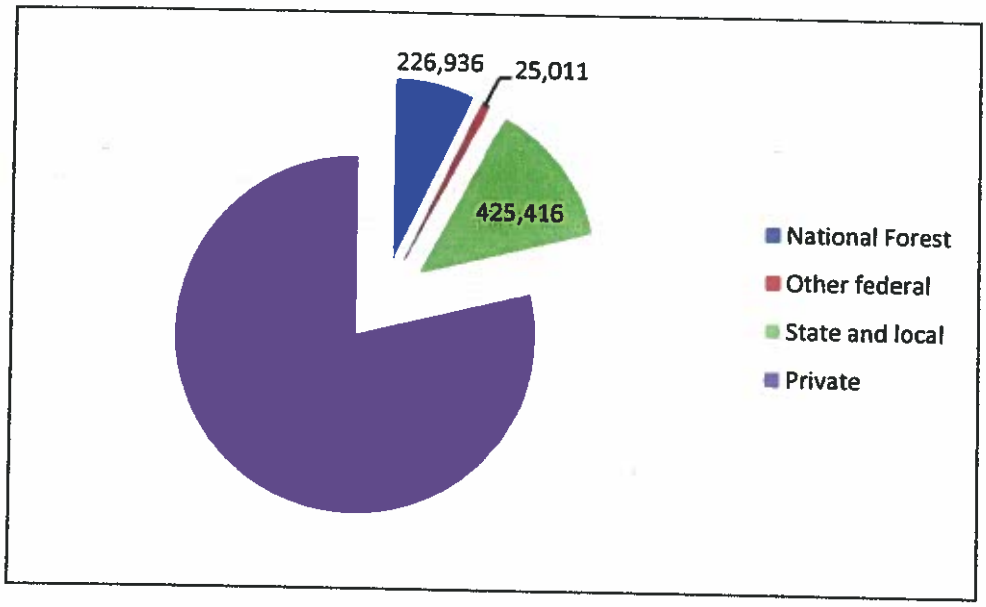
Using the USDA Forest Inventory & Analysis (FIA) database[iii], INRS determined the growth and loss (harvest) for a region within a 50-mile radius of Pownal, Vermont. INRS used the most recent complete FIA information, which uses data collected between 2004 and 2008 for Vermont and Massachusetts, and between 2003 and 2008 for New York[iv].

Figure 6. Fifty Mile Radius of Pownal, VT



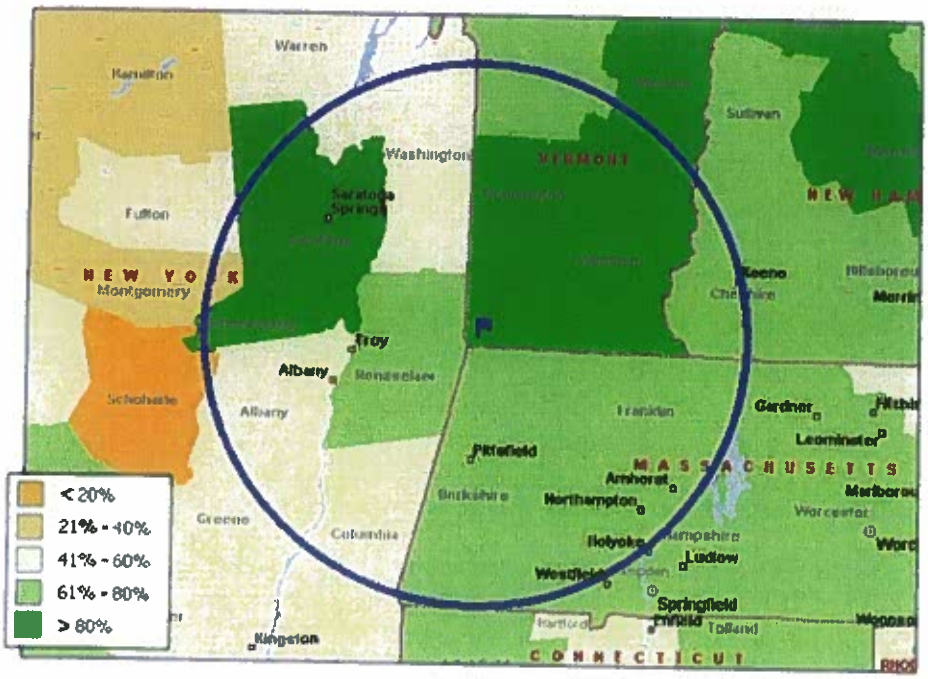
INRS restricted its assessment to timberland – those acres physically and legally capable of producing commercial timber crops[v]. Of the over 3.2 million acres of timberland within fifty miles of Pownal, 79% is in private hands. This is a significant benefit, as public timberland (state, local, US Forest Service or other) is subject to a number of political forces that can make this land difficult to access for forest products. Of importance is that the Pownal property is in close proximity to the Green Mountain National Forest to the North and East; it is probable that little to no wood will come to the facility from this land.

Figure 7. Timberland Ownership within 50 Miles of Pownal, VT (acres)



The region has significant timberland volumes in all directions, with the bulk of it to the north and east; with significant forestland to the south in Massachusetts.

Figure 8. Percent Forestland by County, 50 Mile Radius, Pownal, VT



With all large markets in place and operating, for the 50 miles surrounding Pownal, Vermont, annual growth of roundwood exceeds harvest by nearly 1.9 green tons per year on private lands alone.

Table 1. Standing Inventory and Growth- Removals – Private Lands - 50 Miles of Pownal, VT

	Green Tons
Standing Volume	128,840,034
Annual Growth	3,620,570
Annual Removals	1,761,868
Growth less Removals	1,858,702

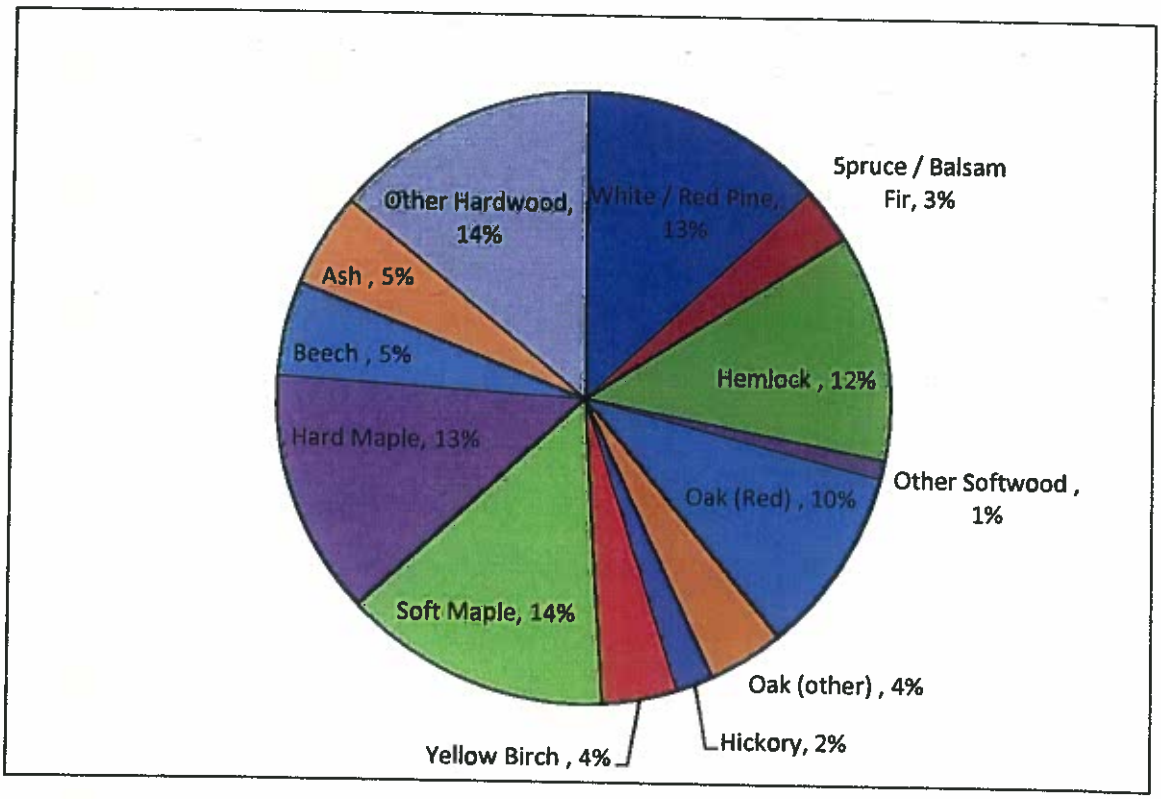
When sawlogs are excluded from the above calculation, assuming that this portion of a harvest is economically unavailable as biomass or pellet feedstock, annual growth exceeds removal by 835,000 green tons annually.

Table 2. Standing Inventory and Growth- Removals – *Non-Sawlog*, Private Lands

	Green Tons
Standing Volume	79,837,176
Annual Growth	2,044,706
Annual Removals	1,209,963
Growth less Removals	834,743

The species mix on private timberland in the region (which will form the bulk of the Pownal supply) is roughly 30 percent softwood, seventy percent hardwood. The figure below shows the breakout by species.

Figure 9. Species Mix, Growing Stock on Timberlands, 50 Mile Radius of Pownal, VT



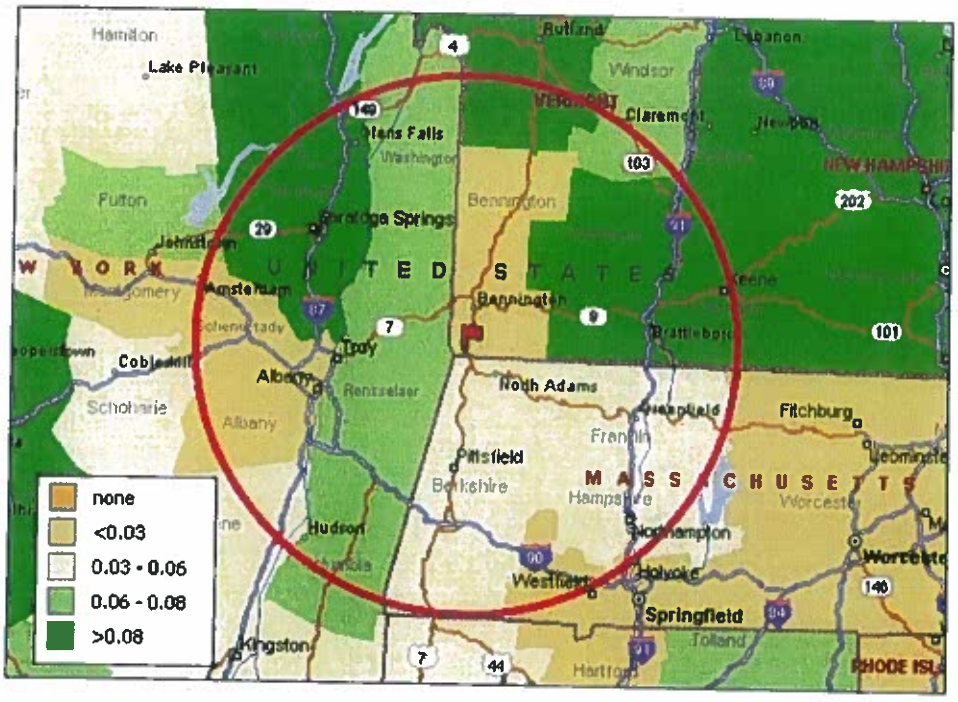
FIA data accounts for only the straight "stem" portion of a tree, not for tops and branches that can be utilized as a biomass fuel (referred to below as forest residue).

INRS has developed a proprietary, national county-level database to estimate the available forest residue. Using historic harvest information and regional tree characteristics, INRS estimates the amount of forest residue[vi] generated annually. The fifty-mile radius around Pownal, Vermont includes all or most of the following counties:

Vermont – Bennington, Windham
New York – Washington, Saratoga, Schenectady, Albany, Rensselaer, Columbia
Massachusetts – Berkshire, Franklin

Within this region, INRS estimates that roughly 252,000 green tons of forest residues are generated annually. Of this, roughly half (126,000 green tons) can be captured and used as biomass fuel; the rest is left in the forest.

Figure 10. Forest Residues (green tons per acre per year), 50 mile radius, Pownal, VT



Modeled Forest Growth – Pownal, VT

Using the information developed above through the USDA Forest Inventory & Analysis, INRS has developed a simple model to estimate the future standing volume of wood in the region.

Assuming all current and historic markets remain constant, and that the Pownal facility uses a total of 415,000 green tons of roundwood (220,000 green tons for pellet operation, plus 195,000 for biomass facility plus additional biomass from tops and branches, etc.), standing timber inventory (growing stock, private lands only) would be expected to grow significantly, from nearly 130 million green tons to over 157 million green tons by 2028.

Table 3. Modeled Standing Volume, Pownal, VT (50 Mile Radius), 2009 - 2028

Year	Volume (green tons, growing stock)
2008	128,840,034
2009	130,273,736
2010	131,707,438
2011	133,141,140
2012	134,574,842
2013	136,008,544
2014	137,442,246
2015	138,875,948
2016	140,309,650
2017	141,743,352
2018	143,177,054
2019	144,610,756
2020	146,044,458
2021	147,478,160
2022	148,911,862
2023	150,345,564
2024	151,779,266
2025	153,212,968
2026	154,646,670
2027	156,080,372
2028	157,514,074

Summary of Competition

The figure and table below shows operating and proposed major biomass or low-grade wood markets in the region, with 30, 60 and 90 minute drive times shown.

The table provides information on each facility, its average annual wood use when operating at normal capacity, and distance to Pownal, VT (Pb). Facilities located well in excess of a 90 minute drive time are not shown.

Figure 11. Other Users of Low-Grade Wood, 30 – 60 – 90 Minute Drive Times

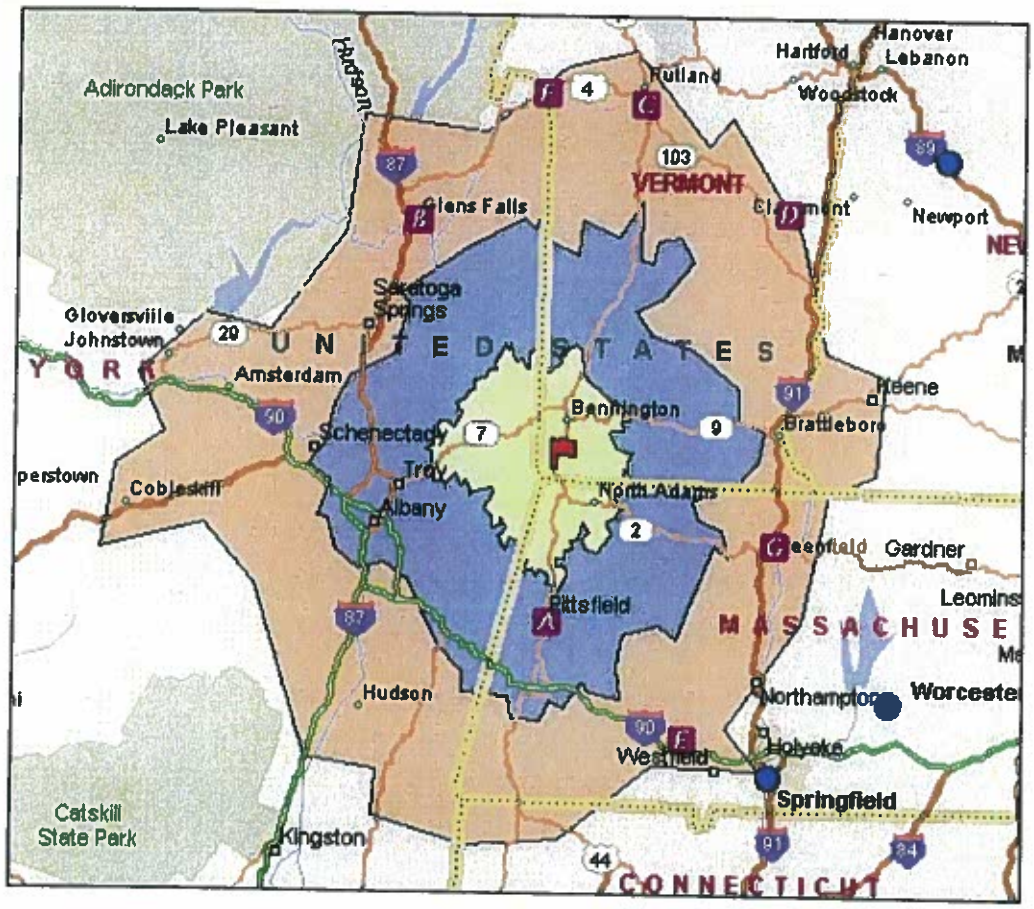


Table 4. Other Users of Low-Grade Wood

Facility A	Crane Paper – Biomass CHP
Location	Pittsfield, MA
Product	Combined Heat & Power Unit at Paper Mill
Owner	Crane & Company (with outside developer)
Annual Wood Use (estimate)	130,000 – 260,000 green tons of biomass fuel
Road miles	26
Minutes	37 minutes
Status	Proposed, pre-permitting

Facility B	Finch Paper LLC
Location	Glens Falls, NY
Product	Paper
Owner	Finch Paper Holdings LLC
Annual Wood Use (estimate)	640,000 green tons of roundwood, 25,000 green tons of biomass
Road miles	54
Minutes	1 hour, 10 minutes
Status	Operating

Facility C	Vermont Wood Pellet Company
Location	North Clarendon, VT
Product	Wood pellets
Owner	Privately held
Annual Wood Use (estimate)	20,000 green tons, plans to double to 40,000 green tons in 2010
Road miles	62
Minutes	1 hour, 18 minutes
Status	Operating, expansion planned

Facility D	North Springfield Sustainable Energy Project
Location	North Springfield, VT
Product	Electricity (25 MW)
Owner	Winstanley Enterprises
Annual Wood Use (estimate)	300,000 green tons
Road miles	70
Minutes	1 hour 29 minutes
Status	Proposed, press reports indicate that the developer has "slowed development activity on the project"

Facility E	Russell Biomass
Location	Russell, MA
Product	Electricity (50 MW)
Owner	Privately held, led by John Bos and Bill Hull
Annual Wood Use (estimate)	600,000 green tons of biomass
Road miles	57
Minutes	1 hour, 18 minutes
Status	Proposed, challenged by MA regulatory situation

Facility F	Beaver Wood– Fair Haven
Location	Fair Haven, VT
Product	Electricity (25 MW) and Wood Pellets (~100,000 ton capacity)
Owner	Beaver Wood Energy LLC
Annual Wood Use (estimate)	~200,000 green tons of roundwood and ~300,000 green tons of biomass
Road miles	65
Minutes	1 hour 23 minutes
Status	Proposed, same developer as Pownal, VT

Facility G	Pioneer Renewable Energy
Location	Greenfield, MA
Product	Electricity (50 MW)
Owner	Madera Energy
Annual Wood Use (estimate)	600,000 green tons of biomass
Road miles	49
Minutes	1 hour, 13 minutes
Status	Proposed, challenged by MA regulatory situation

The following tables summarize current and proposed competitors for biomass fuel and low-grade roundwood within specific drive times of Pownal, VT. It is INRS' experience that the significant majority of proposed biomass facilities are not constructed. Within the region surrounding Pownal, VT there is a sufficient and sustainable supply of roundwood and forest residue to meet the needs of Beaver Wood – Pownal and all existing markets. No other markets, existing or proposed, have a supply region identical to Beaver Wood – Pownal; other facilities will secure significant supply from outside the Pownal, VT supply region.

Table 5. Current and Proposed Competitors by Drive Time

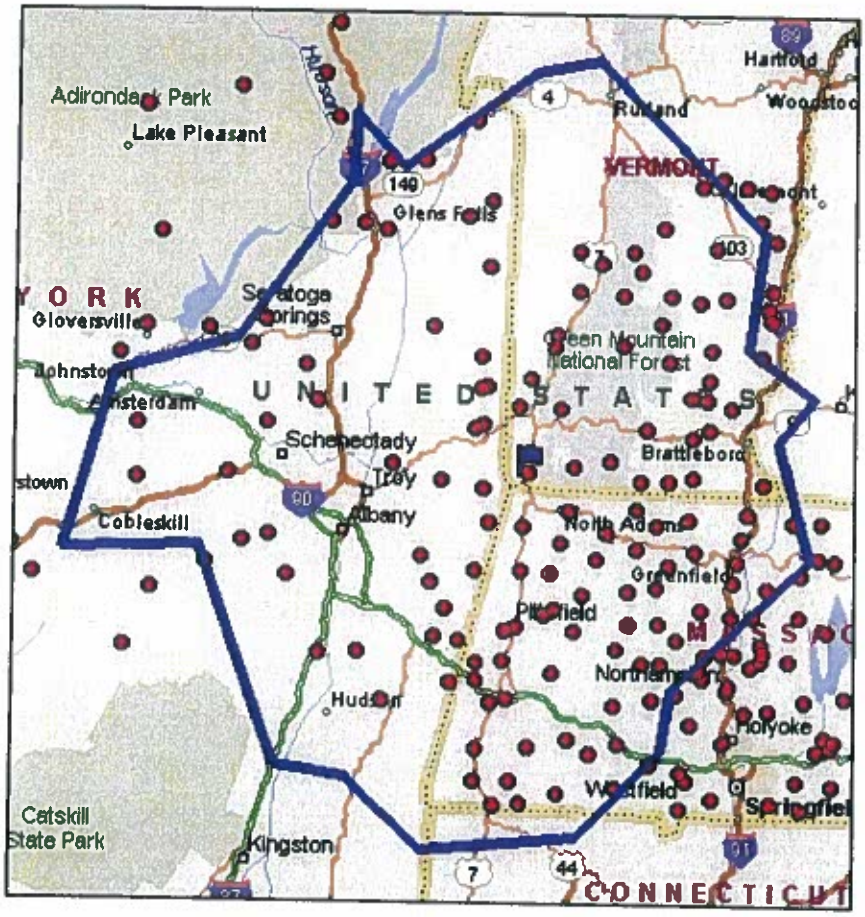
Facility	Current		Proposed	
	Biomass	Roundwood	Biomass	Roundwood
60 Minute Drive Time				
Crane Paper	-	-	260,000	-
90 Minute Drive Time				
Finch Paper LLC	25,000	640,000	-	-
Vermont Wood Pellet	-	40,000	-	-
North Springfield Sustainable	-	-	300,000	-
Russell Biomass	-	-	600,000	-
Beaver - Fair Haven	-	-	300,000	200,000
Pioneer Renewable Energy	-	-	600,000	-
Total	*25,000*	*680,000*	*2,060,000*	*200,000*

Supplier Base

Vermont has a long history as a forest industry region. There is a meaningful logging infrastructure in the region, and a number of mid-sized logging contractors that have the ability to become biomass fuel producers.

The figure below and shows the physical location of a number of suppliers capable of supplying a biomass facility in Pownal, Vermont. INRS contacted a twenty six (of over 700) of these firms / individuals to sample willingness and availability to supply biomass. There was a very positive response from the potential suppliers.

Figure 12. Potential Suppliers, 90 Minute Drive Time



Endnotes

[i] While this is a general description of the variety of products that can be derived from a single tree, it is important to note that the characteristics of an individual tree, combined with local markets, may make all or most of it unsuitable for lumber manufacturing, and then all of the tree would be used for pulp and chip markets, or left in the woods.
[ii] *Note:* This tree is used for illustration purposes only. Forest-grown trees look significantly different than this diagram, generally with longer trunks and less "crown", or leafy top.
[iii] USDA Forest Service EVALIDator 4.01, http://fiatools.fs.fed.us/Evalidator401/tmattribute.jsp
[iv] USDA Forest Service data is presented in cubic feet. INRS calculated green tons assuming 85 cubic feet of solid wood per cord, and that a green cord of wood weighs 2.6 tons for hardwood and 2.3 tons for softwood.
[v] FIA definition of "timberland" is "Forest land that is producing or capable of producing in excess of 20 cubic feet per acre (1.4 cubic meters per ha) per year of wood at culmination of mean annual increment (MAI). Timberland excludes reserved forest lands." http://socrates.lv-hrc.nevada.edu/fia/ab/issues/pending/glossary/Glossary_5_30_06.pdf
[vi] "Forest residue" means tops, branches, crook, sweep, and other tree portions unsuitable for roundwood-based forest products generated during the normal course of a timber harvest.